

Performance of Flexible Silver Nanowire Electrode Coated with Graphene Oxide

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Silver nanowires (ANWs) have been expected to play important role in fabricating transparent electrode for flexible displays. But for actual use of the materials, oxidation resistance of the ANWs, the sheet resistance, optical transmittance, and other characteristic must be enhanced further. In order to improve those properties, we coated ANWs with reduced graphene oxide films. And the diameter of ANWs was reduced from 25nm to 20nm by controlling the processing conditions of the nanowires. Fig. 1(a) shows the images of ANWs prepared in this study. It was noted that the diameter is very uniform throughout the sample. In order to minimize the loss of optical transmittance of the film, it is very important to use ANWs having uniform diameter and to have on layer of graphene oxide. As shown in Fig. 1(b), we can observe the ANWs covered with graphene oxide.

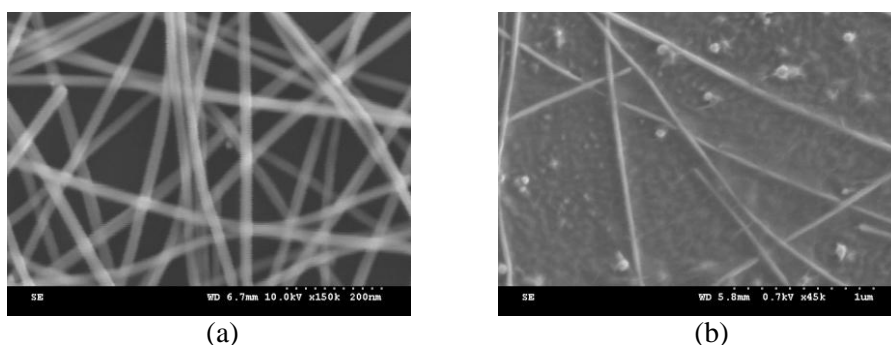


Fig1. Sem image of Raw-ANWs (a) and RGO-coated ANWs (b)

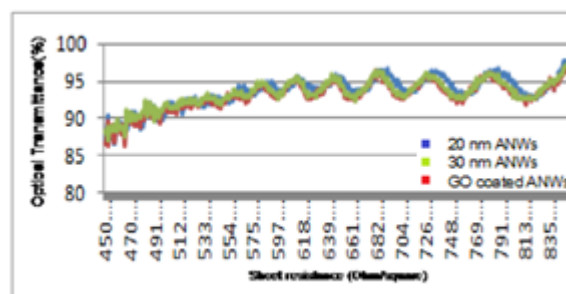


Fig2. Optical transmittance and sheet resistance of ANWs

The sheet resistance and optical transmittance of the ANW film were evaluated. As shown in Fig, optical transmittance was not influenced much as the diameter of ANWs decreased from 30nm to 20nm. The sheet resistance did not changed much with the diameter decrease. When the film was coated with graphene oxide, the optical transmittance was decreased approximately 2~3% compared with the film without the coating. This is in accordance with the fact that ~2.5% decrease with each grapheme layer coating. The improvement of sheet conductance was not apparent with the graphene coating. The effect of graphene coating on the oxidation resistance of ANW film has been tested and will be presented at the meeting.

References

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